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IMPROVING POULTRY

THROUGH THE NATIONAL POULTRY IMPROVEMENT PLAN



Emblem authorized for use by Official State Agencies and industry members to signify cooperation in The National Poultry Improvement Plan.



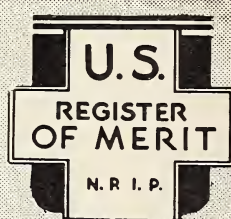
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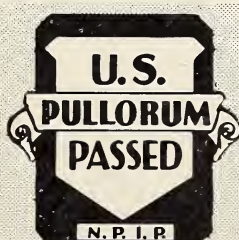


(PURPLE)

Designs authorized to identify each of the four breeding stages of The National Poultry Improvement Plan.



(YELLOW)



(RED)



(BLUE)

Designs authorized to identify each of the three pullorum classes of The National Poultry Improvement Plan.

The poultry industry is demonstrating that effective improvement can be accomplished by the voluntary cooperative efforts of hatcherymen, flock owners, specialized poultry breeders, State poultry officials, and representatives of the United States Department of Agriculture. This is being done through the National Poultry Improvement Plan, a voluntary yet definitely organized program of breeding improvement and pullorum disease control.

In this publication an attempt has been made to describe the plan and its provisions and accomplishments in nontechnical language and to explain points in the plan that are of interest to the average poultryman. Participants in the plan, administrators, supervisors, and others interested in or concerned with the technical provisions should refer to Miscellaneous Publication No. 300, The National Poultry Improvement Plan, which may be obtained upon request from county agricultural agents, extension poultrymen, State agricultural colleges, or the Bureau of Animal Industry, United States Department of Agriculture, Washington 25, D. C.

The following publications dealing with related subjects are also available from the Bureau of Animal Industry:

- A. H. D. No. 25, State Participation in the National Poultry Improvement Plan. This publication contains the name of the contact representative, the official State agency, and the breeding stages and pullorum classes being undertaken in each of the cooperating States.
- A. H. D. No. 125, Annual R. O. P. Summary (published in March each year). This publication contains a list of U. S. R. O. P. breeders listed by breeds together with the performance of their entries for the previous trap-nest record year.
- A. H. D. No. 36, Hatcheries and Dealers Participating in the National Poultry Improvement Plan (published in January each year). This publication contains a list of cooperating hatcheries by States and shows the classification and egg capacity of each.
- A. H. D. No. 122, Directory of U. S. R. O. P. Breeders Qualifying for the U. S. Register of Merit Breeding Stage (published annually). This publication contains the names and addresses of U. S. R. O. P. breeders who have U. S. R. O. M. birds. The summary for each breeder, which is included in this publication, should be useful to prospective purchasers of foundation poultry breeding stock in selecting a good source of supply as it contains a great deal of information on which the quality of the breeding work can be evaluated.
- A. H. D. No. 69, Chickens in N. P. I. P. Hatchery Supply Flocks and Their Distribution by States and Varieties (published annually). This publication indicates trends in the popularity of breeds and varieties.
- A. H. D. No. 40, Educational Aids on the National Poultry Improvement Plan and National Turkey Improvement Plan. This publication contains a list of available educational material and supplies, including bulletins, circulars, motion pictures, and exhibits. It was prepared as a ready reference for official State agencies and all persons associated with the administration or educational work of the plans.

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IMPROVING POULTRY THROUGH THE NATIONAL POULTRY IMPROVE- MENT PLAN

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NEED FOR THE NATIONAL PLAN

When the hatchery industry in the United States began its period of rapid expansion, about 1920, progressive hatcherymen, breeders, and poultrymen began to see the need for organized poultry-improvement programs. The first State-wide poultry-improvement programs on an organized basis were started as early as 1918, and the number of States having such programs increased rapidly as the hatchery industry grew in importance.

While the State programs served a definite need, a great deal of confusion occurred because of the different meanings attached to the same official terms among the States. For example, the term "accredited" meant freedom from pullorum disease in certain States, while in other States the same term designated breeding-improvement work similar to the present U. S. Approved work. As early as 1925

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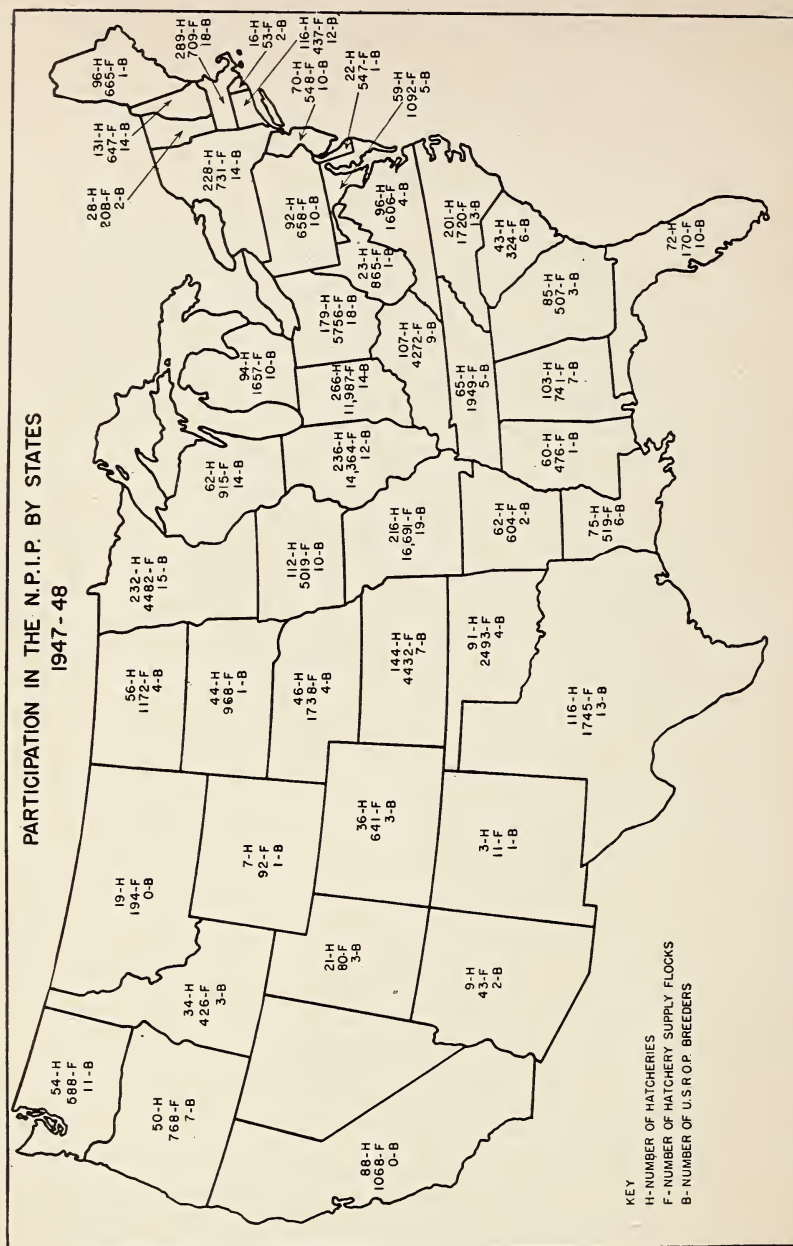


FIGURE 1.—Participation in the National Poultry Improvement Plan by States (1947-48).

consideration was given to the development of a coordinated national plan with uniform provisions and terms. After 10 years of careful consideration of the problem by representative poultry leaders the National Poultry Improvement Plan was formulated and placed in operation July 1, 1935. It is now operating in 47 States (fig. 1).

The acceptance of the plan by the industry is best illustrated by the steadily increasing participation of hatcheries and hatchery supply flock owners. Not only are the numbers of birds in supply flocks increasing, but the numbers in the higher pullorum classes also are increasing (fig. 2). The egg capacity of hatcheries participating in the plan has increased every year since the plan became operative in 1935 (fig. 3). A further indication of confidence in the plan as an instrument in the systematic improvement of poultry is the fact that the greatest growth in participation in the plan occurred in the period between 1943 and 1947, when the increased production of food was most essential. In 1937-38, hatcheries having approximately 15 percent of the total capacity of hatcheries in the United States cooperated in the plan. In 1942-43 this figure was increased to approximately 30 percent, and it is estimated that hatcheries with more than 60 percent of the total capacity cooperated in 1947-48.

ADMINISTRATION OF THE PLAN

The plan is administered cooperatively by an official State agency in each of the cooperating States and the Bureau of Animal Industry of the United States Department of Agriculture. The official State agency is usually the one that was administering the State poultry-improvement program prior to the adoption of the national plan; it may be the State department of agriculture, State college of agriculture, State poultry-improvement board or association, or similar organization recognized by the State government. Authority for an official State agency to administer the plan within the State is a memorandum of understanding between it and the Federal Bureau of Animal Industry. The State agency directs, supervises, and is responsible for flock selection, testing for pullorum disease, flock and hatchery inspection, and other local administrative work involved in the operation of the plan. The Bureau of Animal Industry is responsible for coordinating the program among the cooperating States.

WHO MAY PARTICIPATE AND HOW

Any poultry breeder, hatcheryman, or flock owner in a State having an official State agency for administering the plan may cooperate in the program by signing an agreement with that agency and complying with the provisions of the plan and the requirements of the official State agency. Following proper certification of the quality of his flocks or hatchery products by the State agency, the flock owner, hatcheryman, or poultry breeder may use the emblem (shown on cover page) and those designs and descriptive terms of the plan which are applicable in advertising his flock or hatchery products. The plan is Nation-wide. The adoption of the plan by a State or by an individual member of the industry is entirely voluntary, but a participant must meet the minimum requirements for the breeding stage and pullorum class in which he participates.

HOW THE PLAN ASSISTS THE POULTRY INDUSTRY

The National Poultry Improvement Plan has been developed to assist the poultry industry in placing itself upon a more sound and

FLOCK PARTICIPATION BY PULLORUM CLASSES

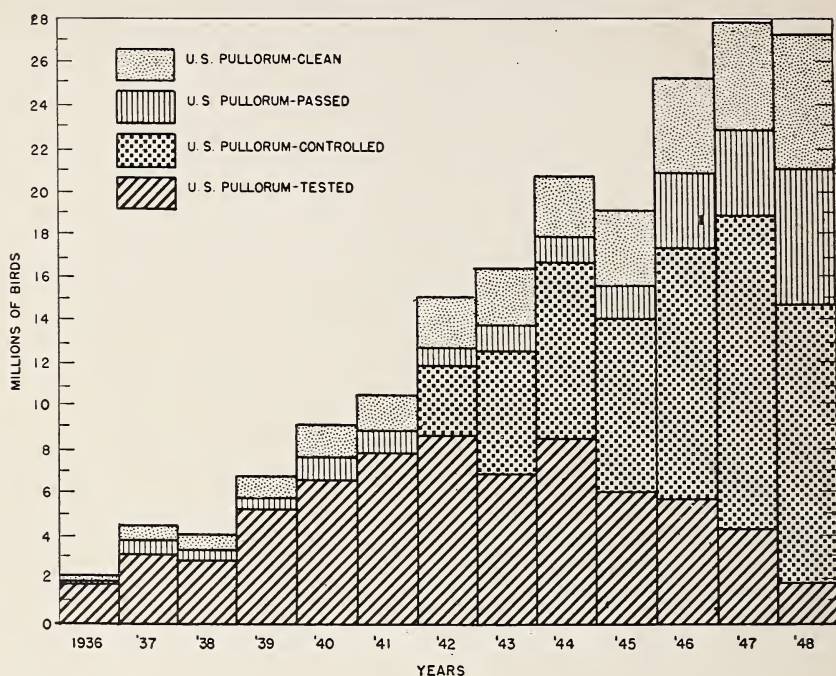


FIGURE 2.—Birds in hatchery supply flocks of the National Poultry Improvement Plan, by pullorum classes.

EGG CAPACITY OF PARTICIPATING HATCHERIES

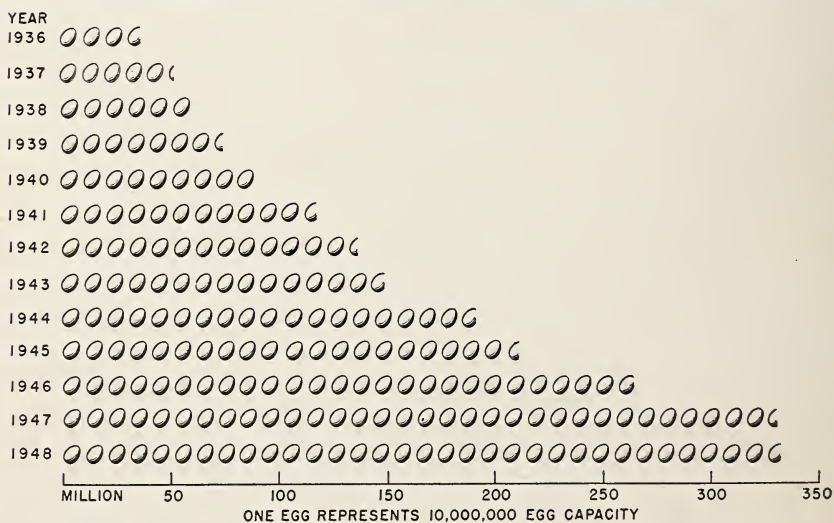


FIGURE 3.—Hatching egg capacity of hatcheries in the National Poultry Improvement Plan.

efficient basis. This is being accomplished through (1) improving the efficiency of production of eggs and poultry meat by the general application of better breeding practices; (2) reducing the losses of chicks from pullorum disease and improving the livability of poultry through better sanitary practices in breeding flocks and hatcheries; (3) the use of official terminology in the identification of breeding stock, hatching eggs, and chicks with respect to quality; and (4) the establishment of an effective cooperative program through which the best results from scientific research and practical experience can be most readily applied to the improvement of poultry and poultry products.

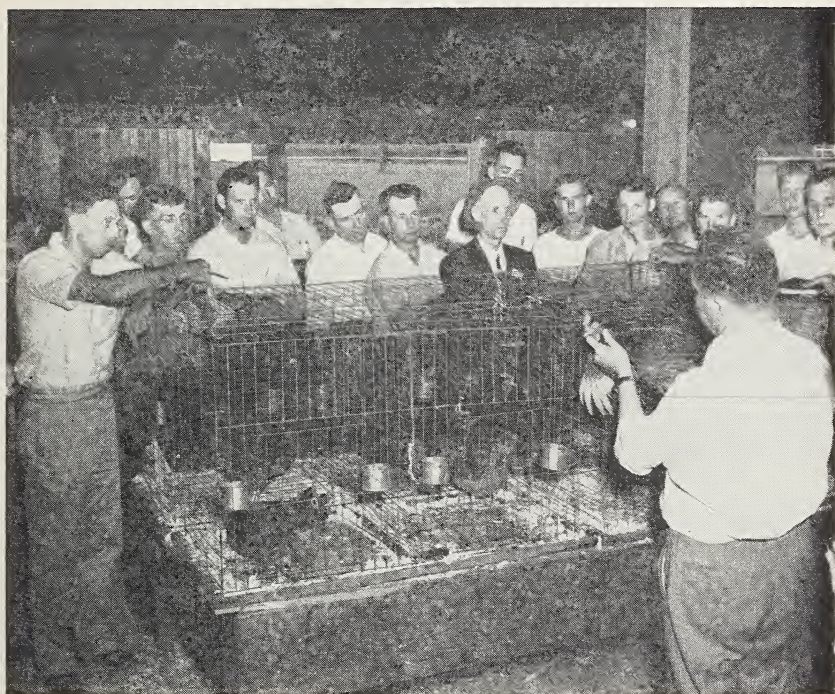


FIGURE 4.—These men are receiving instruction on the selection of breeding stock for production and standardbred qualities. This training is to qualify them to select birds for the breeding flocks of the National Poultry Improvement Plan.

SELECTION, TESTING, AND INSPECTION

The males and females in the breeding flocks are selected individually for constitutional vigor and production and standardbred qualities by authorized flock-selecting agents or State inspectors. At the time of selection each accepted bird is identified with a sealed and numbered official leg band. Flock-selecting agents are trained by the poultry department of the State college of agriculture or other properly constituted agency in the judging of poultry for production and standardbred qualities and in the provisions of the plan as applied in the State, before being authorized by the official State agency (fig. 4).



FIGURE 5.—A class is being trained in the procedure of blood-testing. This training is preparatory to becoming pullorum-testing agents.

Inspections of breeding flocks and hatcheries are made by State inspectors employed by the official State agencies.

The testing of birds for pullorum disease is done by a livestock sanitary official, a representative of the State college of agriculture, or a pullorum-testing agent who is authorized by the official State



FIGURE 6.—State inspector checking eggs in a National Poultry Improvement Plan hatchery. The eggs are checked for size, shape, color, and shell texture as well as for proper identification.

agency to do pullorum-testing work. Testing agents are required to take a course of training and pass an examination on (1) pullorum testing as prescribed by the State livestock sanitary authorities or officials of the State college of agriculture (fig. 5) and (2) the provisions of the National Poultry Improvement Plan and the official State agency. In many cases the same person qualifies to do both flock-selecting and pullorum-testing work.

Participating breeders, hatcherymen, and flock owners are required to keep their premises and equipment in a sanitary condition. In addition, for the purpose of identification and to aid in official inspections, hatcherymen keep records of the name and address of each flock owner, the number of eggs received from him, the name and address of each purchaser, and the number, breed, variety, and date of shipment of all chicks sold. Such records are open for official inspection at all times. Selection and testing are performed under the supervision of State inspectors, and breeding flocks and hatcheries are regularly inspected to insure compliance with official regulations and as an aid in effective improvement work (fig. 6).

LABELS, DESIGNS, AND DESCRIPTIVE TERMS

For the purpose of identifying the products produced under the supervision of the plan, official labels are required to be used on each package of chicks or hatching eggs to indicate the exact breeding stage and pullorum class of the product. Each of the breeding stages and pullorum classes of the plan is named with a term that includes the prefix "U. S." The prefix "U. S." gives the purchaser assurance that the chicks, hatching eggs, or stock were produced in accordance with the requirements of the plan.

A specific design selected for attractiveness and ease of identification has been devised for each of the breeding stages and pullorum classes, as shown on the cover page. The colors of the design are indicated. Use of the official terminology, the emblem, and the designs is limited to those who are participating in the plan and complying with its provisions.

All advertising by participating members is subject to approval by the official State agency.

BREEDING STAGES

The plan includes four progressive breeding stages, each having successively higher requirements in the following order: (1) U. S. Approved, (2) U. S. Certified, (3) U. S. Record of Performance, and (4) U. S. Register of Merit.

Minimum requirements are established for each breeding stage. However, an official State agency may set higher standards for the operations within a State, or an individual breeding farm or hatchery may set higher standards for its own operations. The plan does not limit a participant's efforts, but tends to encourage and stimulate interest in the use of the most advanced methods of breeding and management known.

The plan contains provisions for the production of U. S. Approved and U. S. Certified Crossbred hatching eggs and chicks. The parent

stock must be well selected for good vitality, growth, market quality, and egg production.

A number of general requirements apply to all breeding stages. To participate in a breeding stage, hatcheries and dealers are required to qualify for one of the pullorum classes. U. S. Approved hatching eggs of white-egg breeds are required to be reasonably free from tints, and such eggs of the higher breeding stages are required to be entirely free from tints. Chicks that are seconds, culls, rejects, or are abnormal for breed and variety cannot be sold as National Poultry Improvement Plan chicks.

Specific requirements for egg size have been established for all breeding stages. U. S. Approved and U. S. Certified eggs must weigh at least 1 11/12 ounces each. The minimum weight for eggs in these breeding stages for the months of July through November is 1 10/12 ounces. An exception to this rule is made for the specific purpose of producing chicks designated as "broiler chicks" for which eggs weighing as low as 1 8/10 ounces may be set during the months of July through November. These minimum egg-weight requirements do not apply to breeds and varieties for which the standard weight of the hen is less than 4 pounds. Hatching eggs for all breeding stages are carefully selected for size, shape, color, and shell texture.

U. S. APPROVED BREEDING STAGE

In the U. S. Approved breeding stage the males and females comprising the breeding flock are selected for constitutional vigor and standardbred and production qualities by flock-selecting agents or State inspectors.



FIGURE 7.—Design authorized to identify U. S. Approved flocks, eggs, chicks, and hatcheries.

Hatcheries producing U. S. A. Approved chicks must have all the breeding flocks from which they obtain hatching eggs selected annually by an authorized flock-selecting agent. Each year at least 15 percent of the flocks supplying eggs to a U. S. Approved hatchery and at least 15 percent of the flocks selected by each flock-selecting agent are inspected and approved by a State inspector. Each hatchery is inspected by a State inspector at least once during the hatching season. A U. S. Approved hatchery may produce and sell U. S. Approved hatching eggs and chicks. It may also produce and sell U. S. Certified chicks of some variety other than that produced and sold as U. S. Approved, provided that all the chicks of the variety are U. S. certified. Figure 7 shows the design used for the U. S. Approved breeding stage.

U. S. CERTIFIED BREEDING STAGE

In the U. S. Certified breeding stage the females must meet the same requirements as in the U. S. Approved, but the males must be U. S. R. O. P. males. These males are described under U. S. Record of Performance breeding stage.

The males and females used in U. S. Certified flocks must be selected by either a State inspector or a flock-selecting agent once each year. If the selecting is done by a flock-selecting agent, a State inspector must inspect at least 50 percent of the flocks selected by each agent. Each U. S. Certified hatchery is inspected by a State inspector at least twice during the hatching season.

A U. S. Certified hatchery may produce and sell only U. S. Certified hatching eggs and chicks. The design for the U. S. Certified breeding stage is shown in figure 8.

U. S. RECORD OF PERFORMANCE BREEDING STAGE

The breeders in this stage carry on a very extensive program of trap-nesting, pedigree breeding, and record keeping. All of their breeding operations must be under official supervision.



FIGURE 9.—Design authorized to identify U. S. Record of Performance flocks, eggs, chicks, and breeding stock.

time. Detailed records are kept on trap-nesting, hatching, and wing-banding operations. Figure 9 shows the design used for this breeding stage.

U. S. REGISTER OF MERIT BREEDING STAGE

Sires and dams qualified for this advanced breeding stage on the basis of the performance of their daughters, thus giving recognition to progeny testing. A male that heads a supervised single-male mating is classed as a U. S. R. O. M. male when a minimum of 20 and at least one-half of his daughters entered under U. S. R. O. P. supervision qualify as U. S. R. O. P. females. A female member of a



FIGURE 8.—Design authorized to identify U. S. Certified flocks, eggs, chicks, and hatcheries.



FIGURE 10.—Design authorized to identify U. S. Register of Merit males, females, and matings.

single-male mating qualifies for U. S. R. O. M. when a minimum of 4 and at least one-half of her daughters entered in U. S. R. O. P. qualify as U. S. R. O. P. females. Figure 10 shows the design used for this breeding stage.

All candidates for U. S. R. O. P., as well as qualified females used in



FIGURE 11.—The eggs of a trap-nested hen are weighed under the requirements of the U. S. R. O. P. breeding stage.



FIGURE 12.—Each egg is marked with the number of the hen that laid it.

U. S. R. O. P. matings, are trap-nested (fig. 11). Each egg is marked with the number of the hen that laid it (fig. 12), and each hen's eggs are sorted and kept separate for the incubator (fig. 13). The eggs from each individual hen are placed in a separate hatching basket (fig. 14) and at the end of the incubation period, the chicks hatching from the eggs are removed and wing bands are attached which carry the identification number.

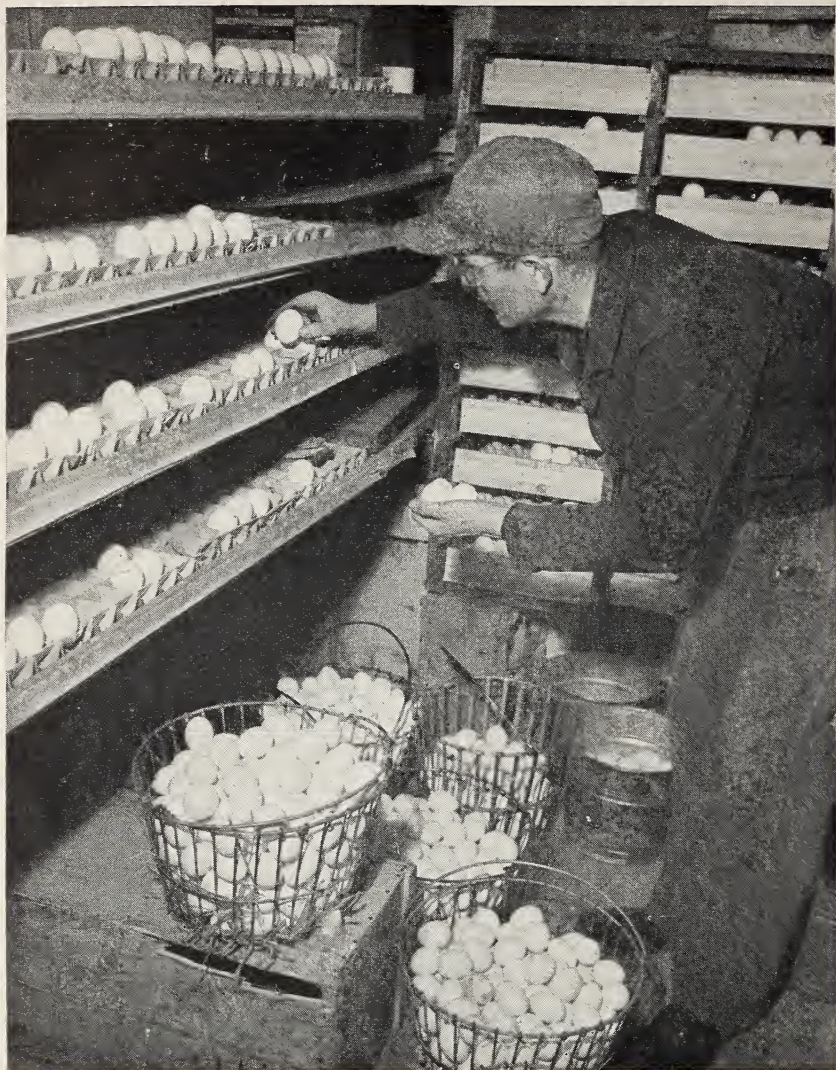


FIGURE 13.—Sorting out the eggs from individual hens prior to setting them in the incubator.

The extent of the participation in the advanced breeding stages is illustrated in table 1.

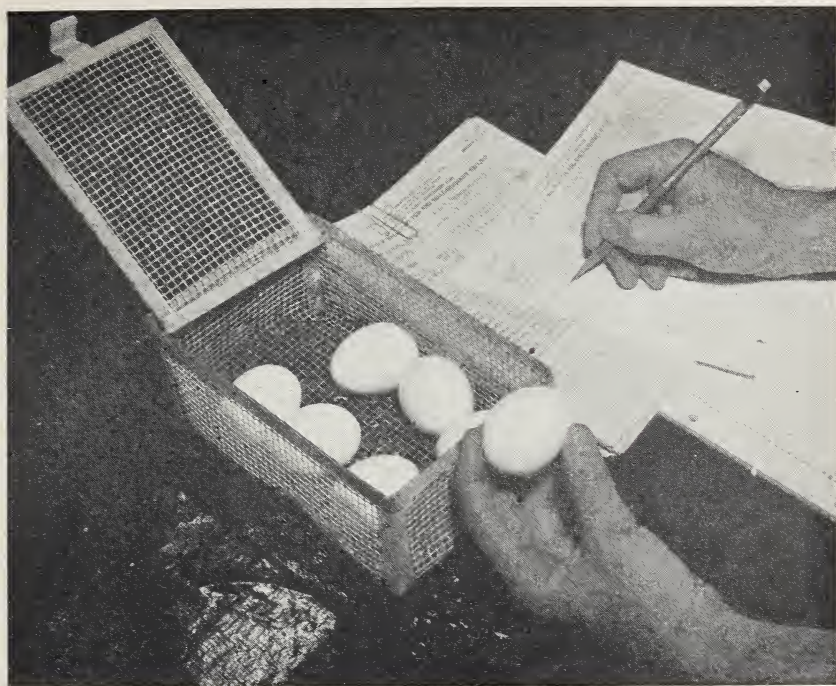


FIGURE 14.—The eggs from an individual hen being placed in a separate hatching basket and recorded so that each chick hatched can be properly identified at hatching time.

TABLE 1.—*Number of flocks participating and candidates trap-nested under the U. S. Record of Performance breeding stage, and number of birds qualifying as U. S. Register of Merit sires and dams*

Year	U. S. R. O. P.		U. S. R. O. M.	
	Flocks	Candidates trap-nested	Sires	Dams
1935-36-----	190	16, 574	36	144
1936-37-----	352	112, 202	52	310
1937-38-----	352	108, 183	89	418
1938-39-----	396	124, 937	155	809
1939-40-----	429	144, 447	191	1, 153
1940-41-----	445	154, 969	337	1, 919
1941-42-----	425	160, 022	420	2, 483
1942-43-----	435	151, 685	408	2, 333
1943-44-----	447	159, 534	514	2, 873
1944-45-----	444	173, 183	707	3, 785
1945-46-----	471	211, 669	796	4, 745
1946-47-----	471	220, 183	729	5, 236
1947-48-----	464	215, 198	(¹)	(¹)

¹ Data not available at time of publication.

PULLORUM CLASSES

Pullorum disease (formerly called bacillary white diarrhea) is widespread. It exists in every section of the United States where appreciable numbers of poultry are kept. Heavy financial losses result from the deaths of baby chicks, lowered egg production in hens and pullets, reduced hatchability of eggs, and occasionally the death of hens due to generalized pullorum infection. Fortunately this disease may be controlled by removal of all individuals in the breeding stock that react to the blood tests. It is important also to employ strict sanitary methods in incubating and brooding chicks as a further measure of control.

The number of States with official testing programs and the volume of testing have increased rapidly. The percentage of reactors in officially conducted tests continues to be reduced with each successive year of testing (fig. 15). The volume of testing has increased from slightly more than 4 million birds in 1935-36 to over 30 million in 1947-48.

As in the breeding stages only minimum requirements are established for each pullorum class. The official State agencies of several States recognize only the U. S. Pullorum-Passed and U. S. Pullorum-Clean classes, while in a few States the maximum permitted tolerance for the U. S. Pullorum-Controlled classification has been established at fewer than 1 percent of reactors.

The plan requires that all birds be officially tested for pullorum disease before they are eligible for participation in any of the breeding stages of the plan.

Any one of the following officially recognized methods may be used in testing chickens for pullorum disease: (1) Tube agglutination test, (2) stained-antigen rapid whole-blood test, and (3) rapid serum test. (Each method is described in detail in Miscellaneous Publication 300, The National Poultry Improvement Plan.)

Some of the general regulations which apply to all pullorum classes are:

1. All birds remaining in the breeding flock following the test shall be properly leg-banded.
2. All other domesticated fowl on the premises shall be either tested and shown to meet the same pullorum tolerance as the breeding flock of chickens or kept segregated from the flock at all times.
3. All hatcheries participating in the pullorum classes shall be inspected and approved by a State inspector at least once during the hatching season.
4. Each year at least 15 percent of the flocks participating in the pullorum classes shall be inspected and approved by a State inspector.

When the plan first became operative in 1935 it contained four progressive pullorum classes, including the U. S. Pullorum-Tested class, which at that time had no maximum tolerance requirement. Through the establishment of a maximum tolerance of less than 10 percent re-

OFFICIAL CONTROL OF PULLORUM DISEASE, IN CHICKENS, IN THE UNITED STATES

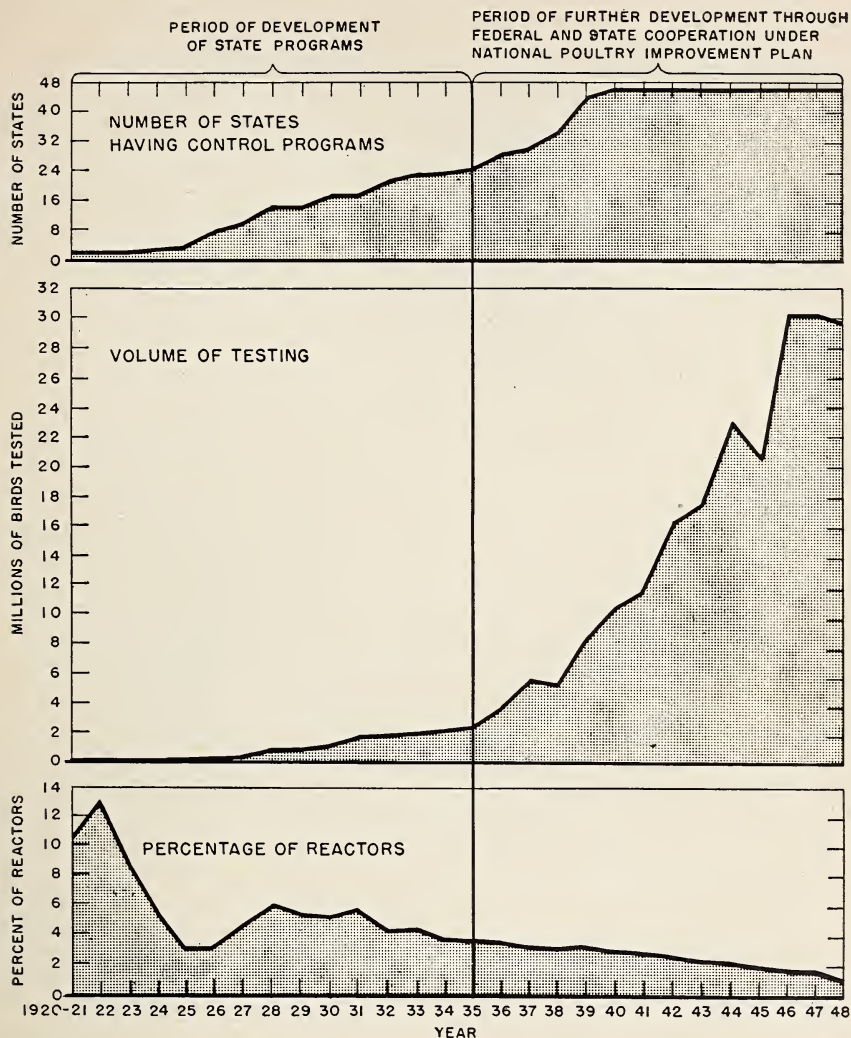


FIGURE 15.—Charts showing progress of official pullorum disease control work in the United States.

action in this class and a program of continually reducing the permitted tolerance over a period of years the U. S. Pullorum-Tested class became obsolete. A decision was made to delete this class from the plan at the end of the 1948-49 hatching season. The gradual reduction of the permitted tolerance in this class no doubt had a considerable effect on the over-all reduction of pullorum reaction in supply flocks as

illustrated in figure 15. The remaining pullorum classes of the plan, each having successively higher requirements, are as follows: (1) U. S. Pullorum-Controlled, (2) U. S. Pullorum-Passed, and (3) U. S. Pullorum-Clean.



FIGURE 16.—Design authorized to identify U. S. Pullorum-Controlled flocks, eggs, chicks, and hatcheries.

diately preceding the date of sale of hatching eggs or chicks. Figure 16 shows the design used for the Pullorum-Controlled Class.

U. S. PULLORUM-PASSED CLASS

All chickens over 5 months of age in breeding flocks and on the same premises are tested by a State pullorum tester or a pullorum testing agent. U. S. Pullorum-Passed flocks do not contain any reactors on the last test made within the testing year immediately preceding date of sale of hatching eggs, chicks, or breeding stock. Birds introduced into the flocks are from U. S. Pullorum-Passed or U. S. Pullorum-Clean flocks. The design used for this class is shown in figure 17.

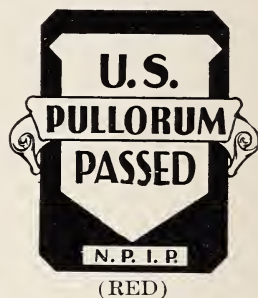


FIGURE 17.—Design authorized to identify U. S. Pullorum-Passed flocks, eggs, chicks, and hatcheries.

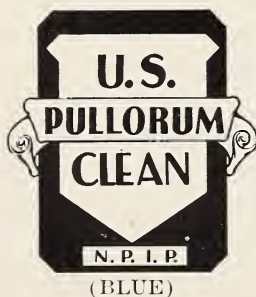


FIGURE 18.—Design authorized to identify U. S. Pullorum-Clean flocks, eggs, chicks, and hatcheries.

U. S. PULLORUM-CLEAN CLASS

All chickens over 5 months of age to be retained as breeders in Pullorum-Clean flocks are tested annually by a State pullorum tester or a pullorum testing agent. When the testing is done by an agent, a representative of the official State agency check-tests a specified sample of the flocks to make sure that the testing work is satisfactory. Pullorum-Clean flocks contain no reactors either in two consecutive tests not less than 6 months apart or in three consecutive tests not less than 30 days apart, the last test being made within the testing year immediately preceding the date of sale of hatching eggs or chicks. Flocks developed exclusively from U. S. Pullorum-Passed or U. S. Pullorum-Clean chicks are recognized as U. S. Pullorum-Clean on one annual

test if no reactors are found. Figure 18 shows the design used for this breeding stage.

PROCEDURE FOR MAKING CHANGES IN THE PLAN

The plan requires revision from time to time in order to conform with the development of the industry and with new information as it becomes available. Suggested changes must be in keeping with the original purposes of the plan. The procedure for making them is democratic and cooperative.

Changes in the provisions of the plan may be proposed by any participant, administrative official of the plan, official State agency, industry organization, or the Bureau of Animal Industry. They are submitted in writing through the proponent's official State agency and are usually accompanied by a supporting statement. A complete list of all proposed changes is then compiled by the Bureau of Animal Industry and issued in processed form to all interested participants.

Changes are acted upon only at a national conference of official delegates of the National Poultry Improvement Plan. Each State cooperating in the National Poultry Improvement Plan is entitled to one official delegate. The delegate is elected by a representative group of participating industry members and certified by the official State agency. Proposed changes are acted upon only after careful consideration in committees and on the floor at the general conference, and are adopted by a majority vote of the official delegates present and voting.

Proposed changes adopted by the conference are then recommended to the Bureau of Animal Industry for incorporation in the provisions of the plan.

THOSE WHO WILL BENEFIT BY THE PLAN

The National Poultry Improvement Plan is based on tried breeding and pullorum-control practices that, over a period of years, have demonstrated their value in improving the breeding and production qualities of poultry and reducing losses from pullorum disease (fig. 15). Therefore its extensive and efficient operation over a sufficient period of years should greatly benefit the entire industry and the consumers of poultry products.

The principal benefits to be derived by buyers of chicks and breeding stock are (1) a consistent improvement in stock, leading to a more efficient production (fig. 19) of better quality poultry products; (2) decreased mortality in chick and adult flocks, resulting from pullorum-disease control and better flock and hatchery sanitary practices; and (3) adequate information concerning the quality of stock available, so that it may be bought with confidence and with greater assurance of being the quality desired.

Flock owners who produce hatching eggs may expect (1) improvement of their own breeding flocks through selection, pullorum control, and suggestions as to the best management practices; and (2) availability of better foundation stock for the improvement of their flocks.

Hatcherymen receive aid in numerous ways such as (1) official certification of the quality of products which they produce; (2) identifica-

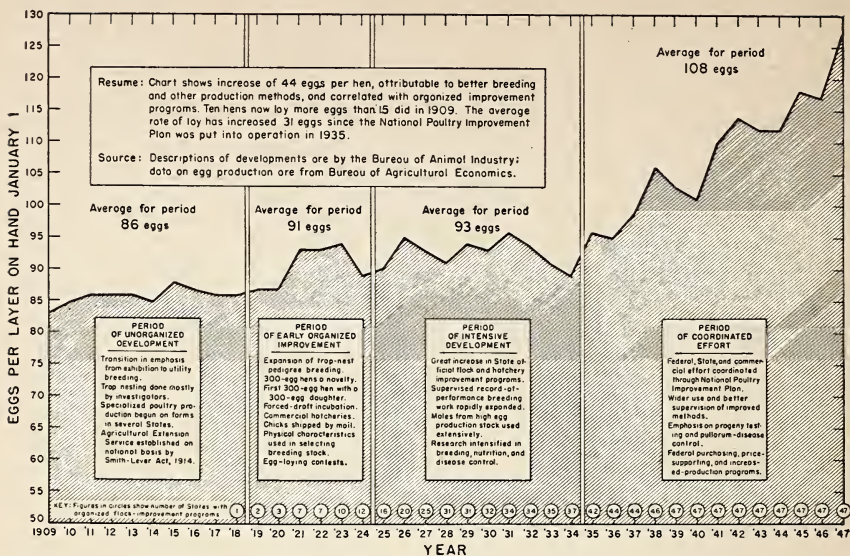


FIGURE 19.—Trend of average egg production in the United States as related to development of poultry industry.

tion of good foundation male stock for their hatching-egg flocks; (3) better cooperation from their hatching-egg producers; (4) education of the poultry public regarding the quality and soundness of their production program; and (5) simple and essential records useful in the efficient and profitable operation of their business.

Poultry breeders doing trap-nesting and pedigree breeding are aided (1) in developing sounder breeding programs, (2) in obtaining the most satisfactory type of forms for keeping records of all breeding operations and results, and (3) in the certification of their stock on the basis of its merit.

Evidence of the value of advanced breeding work from the standpoint of egg production is illustrated in the following data:

Average annual egg production per laying hen on farms in United States, 1947-----	127
Average annual egg production of pedigreed U. S. R. O. P. candidates, 1946-47 (trap-nest record year)-----	186
Average annual egg production of daughters of U. S. R. O. M. sires, 1946-47-----	222
Average annual egg production of daughters of U. S. R. O. M. dams, 1946-47-----	222

Marketing agencies and the consuming public also benefit materially from the greater uniformity and superior quality of eggs and poultry meat resulting from the cooperation of the breeder and hatchery industry in the national plan.

